

CLAIMS:

1.

1 A reinforcing structure of a fuel tank having a first and an opposing
2 second wall defining a fuel chamber, the reinforcing structure comprising:

3 a first indentation carried unitarily by the first wall and extending into the
4 fuel chamber, the first indentation having a bottom portion engaged to the opposing
5 second wall; and

6 a stress relief feature disposed within the chamber, the stress relief feature
7 having an engagement area being annular in shape and thus formed by the engagement of
8 the bottom portion to the opposing second wall.

2.

1 The reinforcing structure set forth in claim 1 comprising a second
2 indentation carried unitarily by the second wall, the second indentation having a bottom
3 portion wherein the stress relief feature is formed between the bottom portions of the
4 first and second indentations.

3.

1 The reinforcing structure set forth in claim 2, wherein the bottom portions of the
2 first and second indentations enclosed by the annular engagement area form a void.

4.

1 The reinforcing structure set forth in claim 3, wherein the stress relief
2 feature has a radial opening communicating between the void and the chamber and for
3 providing a starting point for a bursting tear through the annular engagement area when a
4 predetermined internal or external pressure is exceeded.

5.

1 The reinforcing structure set forth in claim 4 wherein the circumferential
2 orientation of the opening is dependent upon the direction of adverse forces exerted upon
3 the tank.

6.

1 The reinforcing structure set forth in claim 3, wherein the bottom portions
2 of the first and second indentations have a substantially constant wall thickness, and
3 wherein the engagement area is seventy-five percent or less than the cross section area of
4 either adjacent indentation.

7.

1 The reinforcing structure set forth in claim 6, wherein the fuel tank is a
2 multi-layered structure of plastic material and is formed by a blow mold process.

8.

1 A fuel tank comprising:
2 a first wall;
3 a second wall opposed to the first wall;
4 a chamber defined between the first and second walls; and
5 a reinforcing structure having a first indentation projecting into the
6 chamber from the first wall, a second indentation projecting into the chamber from the
7 second wall, a stress relief feature disposed within the chamber, and wherein a bottom
8 portion of the first indentation is engaged to a bottom portion of the second indentation.

9.

1 The fuel tank set forth in claim 8 wherein the first and second indentations
2 are unitary to the respective first and second walls.

10.

1 The fuel tank set forth in claim 9 wherein the stress relief feature is
2 disposed between the bottom portions of the first and second indentations and wherein
3 the bottom portions are engaged directly by an engagement area of the stress relief
4 feature.

11.

1 The fuel tank set forth in claim 10 wherein the engagement area is welded
2 and annular in shape, and wherein the bottom portions disposed radially inward from the
3 engagement area form a substantial spherical void.

12.

- 1 The fuel tank set forth in claim 11 wherein the stress relief feature has a
- 2 radial opening communicating between the chamber and the void.

13.

- 1 The fuel tank set forth in claim 12 wherein the radial opening and the
- 2 engagement area are disposed along an imaginary plane.

14.

- 1 The fuel tank set forth in claim 9 wherein the stress relief feature has an
- 2 elongated stress relief bar disposed within the chamber and engaged between the first
- 3 and second indentations at opposing ends.

15.

- 1 The fuel tank set forth in claim 14 wherein the stress relief feature has a
- 2 groove carried transversely by the bar and for providing a starting point for a bursting
- 3 tear through the bar when a predetermined internal or external pressure is exceeded.

16.

- 1 The fuel tank set forth in claim 15 wherein the stress relief bar is made of
- 2 plastic.

17.

1 A fuel tank comprising:
2 a first wall;
3 a second wall opposed to the first wall;
4 a first indentation projecting into the chamber from the first wall;
5 a second indentation projecting into the chamber from the second wall;
6 a hollow protrusion projecting acutely via a juncture into the chamber
7 from a distal end portion of the second indentation; and
8 wherein the hollow protrusion engages the first indentation at a distal end.

18.

1 The fuel tank set forth in claim 17 comprising:
2 the second wall having an interior surface exposed to the chamber and an
3 exterior surface;
4 a plug engaged sealably to the exterior surface of the second wall at the
5 second indentation; and
6 a secondary chamber defined by the second indentation and carried
7 between the exterior surface of the second wall and the plug.

19.

1 The fuel tank set forth in claim 18 wherein the smallest wall thickness
2 defined between the interior and exterior surfaces of the second wall is located at the
3 juncture of the second indentation, and wherein the cross section area of the second
4 indentation at the juncture is smaller than the area of the distal end of the protrusion.

20.

1 The fuel tanks set forth in claim 19 wherein the distal end is square in
2 shape.